Hw 1

1. (#6, p.48, [Alpaydin]) In the regression problem, we use the error function $E(g|D) = \frac{1}{N}\sum_{i=1}^{N}[y_i - g(\mathbf{x}_i)]^2$ to sum up the squares of the differences between the actual value and the estimated value. This error function is not robust to outliers. What would be a better error function to implement robust regression. (Hint: You only need to find one error function, either through google search or check the cases in Sec.12.4 or Sec. 14.10, and briefly explain why it is more robust to outliers than the squared error one.)

2. (#7, p.48, [Alpaydin]) Please read Ch 2.6 and derive equation (2.17) to solve the two unknowns w_1, w_0.

3. (#8, p.48, [Alpaydin]) How can we estimate the unknowns w_2, w_1, w_0 for the quadratic model of equation (2.18)?

4. (#11, p.48, [Alpaydin]) Assume that our hypothesis class is the set of lines. Write down an error function that not only minimizes the number misclassification but also maximize the margin. (Hint: You may refer to Sec 14.3 to find one possible error function.)